Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

NATIONAL GUIDELINE CLEARINGHOUSE

General

Guideline Title

Recommendations for preprocedural fasting for the breastfed infant: "NPO" guidelines.

Bibliographic Source(s)

Academy of Breastfeeding Medicine. Recommendations for preprocedural fasting for the breastfed infant: "NPO" Guidelines. Breastfeed Med. 2012 Jun;7(3):197-202. [43 references] PubMed

Guideline Status

This is the current release of the guideline.

Recommendations

Major Recommendations

Definitions for the quality of evidence (I-III) are provided at the end of the "Major Recommendations" field.

1. Minor painless procedures or procedures requiring local anesthesia for pain control that do not require sedation or fasting. Minor procedures such as circumcision with a local block, diagnostic examinations, placement of peripheral intravenous lines, and drawing blood can be performed without sedation or general anesthesia. A procedure that is considered minor should cause minimal physical trauma and psychological impact, therefore not requiring sedation. Without sedation, the infant can protect his or her airway with an intact cough/gag reflex, and thus fasting is not required (I). The need for sedation should be decided upon at the physician's discretion based on the intensity and duration of the procedure as well as the infant's medical history. If sedation is not necessary, the need for oral analgesics or other means for comfort should be determined by the practitioner.
    - *If it is a minor procedure not requiring sedation or general anesthesia, then feed normally*. Infants are more likely to tolerate minor procedures when the usual feeding pattern is maintained. They will be more comfortable when they have eaten in a normal routine. Without anesthesia, even if the patient is sleeping during the procedure, the upper airway reflexes are intact, and infants will be able to naturally protect their airways (I).
    - *If possible, consider breastfeeding for comfort during the minor procedure without sedation*. Breastfeeding while receiving a heel stick, intravenous placement, or drawing blood has been shown to be an effective means of pain relief and should be an option made available to mothers and infants (III).
    - *Exceptions for the active patient*. The child who is unable to follow instructions or cooperate because of age or level of development may require sedation for minor procedures after efforts to perform the procedure without it have failed. Under these circumstances, the procedure may need to be postponed so that the patient can follow strict fasting guidelines.
2. Diagnostic examinations or invasive procedures requiring pharmacologic immobilization or sedation. Procedures that are more painful or

stressful, such as bone marrow biopsies or lumbar puncture with intrathecal chemotherapy administration, require sedation (III). Other procedures may require a motionless patient, such as central line placement or magnetic resonance imaging/computed tomography exams. In these situations, a licensed anesthesia provider may need to perform a general anesthetic, but these procedures can possibly be performed under sedation if a strict sedation protocol is followed and the provider is well trained (III).

- *When should the infant fast*? When an infant undergoes a surgery or diagnostic examination under anesthesia, the mother must withhold breastfeeding for at least 4 hours prior to anesthesia (see the Table below) (III). Conditions such as gastroesophageal reflux disease have not been shown to change the gastric emptying times versus controls, so recommendations for these patients do not differ (I).
- *If the infant needs to fast, provide clear instructions to the caregiver*. The physician providing or supervising the sedation or anesthesia at the hospital, clinic, or surgery center must provide strict fasting instructions to minimize adverse outcomes such as pulmonary aspiration, hypoglycemia, and volume depletion (I). These instructions are often provided in a preprocedure office visit and/or by phone the day before the scheduled procedure. The mother can be reassured that adherence to fasting guidelines is for the safety of her child.
- *Consider the infant's daily medications*. Vital prescriptions such as antiepileptics, reflux, and cardiac medications should be taken as scheduled. If the prescription in the form of a clear sugar-based syrup, then the volume of the medication and its rapid absorption make the risk of aspiration of the medication lower than the risk of missing the needed prescription drug (I). This is also true of oral liquid acetaminophen/paracetamol, which may be given to the child prior to the procedure for analgesia. When possible, the dose can be timed a little earlier or a little later to separate the ingestion from the time of anesthesia. Whenever possible, nonprescription medications, multivitamins, or any medications that are opaque or alkaline should be avoided for 8 hours before a procedure because they are considered equivalent to solids (III).
- *It is best to finish breastfeeding at 4 hours prior to fasting and anesthesia*. Per American Society of Anesthesiologists (ASA) guidelines, the mother (or other caretaker) should be advised to finish breastfeeding or providing breastmilk to the infant approximately 4 hours prior to the scheduled surgery time, even if the infant needs to be awakened. Waking the child to feed 4 hours prior to the scheduled procedure decreases the risk for hypoglycemia and hemodynamic instability, especially in children less than 3 months old (II-1). This optimizes the infant's glycogen stores and volume status because the infant might otherwise sleep through the night and not receive optimal nutrition or hydration prior to the scheduled surgery or procedure.
- *Continue clear liquids until 2 hours prior to anesthesia*. Ad libitum clear liquids up to 2 hours prior to anesthesia or sedation are recommended (III). They are considered safe up to 2 hours prior because they empty from the stomach much more rapidly than human breastmilk (HBM). They can prevent volume depletion, improve glycogen stores, and maximize hemodynamics by hydrating the infant. The most common clear liquids provided to breastfeeding patients are apple juice, water, sucrose-based solutions, clear broth (nonfat commercially prepared only—homemade will have fat in it), and electrolyte solutions. Water is least preferred because of the absence of a glucose source. If the mother prefers to avoid the bottle, the clear liquid can be offered via a small cup, syringe, or spoon (III). Clear liquids can help to soothe an anxious infant while fasting and separated from the mother's breast. This can help to maximize satisfaction of the patient and parent and allow for a more pleasant perioperative experience.
- *Do not give formula and other HBM supplements for at least 6 hours prior to the anesthesia*. Enriched feedings include additives or supplements to expressed HBM, like formula, protein powder, vitamins, or minerals. These empty more slowly from the stomach and worsen the lung injury if aspirated. Some fortifications to HBM may not change the gastric emptying (II-1), but to avoid confusion, HBM given to an infant 4 hours prior to surgery must be "non-enriched."
- *Do not give non-human milk for 6–8 hours prior to the anesthesia*. Gastric emptying times of soy, rice, or cow's milk vary, and volume ingested must be considered. Thus, it is safest to recommend that all non-human milk be held for 6–8 hours (III).
- *Solid food must be avoided for at least 8 hours prior to the anesthesia*. An 8-hour fast is recommended for fatty or proteinaceous solids such as meat or any fried food (III). This is suggested for children who are at the stage of development when they are concurrently eating solid foods and breastfeeding. To avoid confusion, most physicians recommend a fast from all heavy solid meals, which would include most foods fed to babies, for an 8-hour period.
- *Postpone sedation or anesthesia if fasting requirements are not met*. If an infant has breastfed within 4 hours prior to an elective sedation or anesthetic, the risk of aspiration of acidic contents or particulate matter is greatly increased (III). Attempts to allow "non-nutritive" suckling of the breast for infant comfort within the 4 hours prior to anesthesia may increase gastric contents and should not occur (III). Also, if clear liquids have been ingested in the 2 hours prior to sedation, the patient can have residual gastric contents. Thus, if the procedure is not an emergency, the case should be cancelled or postponed until the minimum fasting period is met.

3. Comfort for the infant and mother during a fast. Infant comfort during the fasting period can be addressed with a pacifier (dummy) or other measures such as swaddling, rocking, and holding by caregivers or nursing staff. The mother holding the infant may send signals consistent with an impending meal; thus some mothers find that the infant may need to be held by another adult during the fasting period.
    - *Use of a pacifier (dummy) in the nothing by mouth (NPO) period*. Non-nutritive sucking on a pacifier (or a gloved clean finger) has been shown to reduce crying spells and can be considered a temporary measure in the preoperative NPO period prior to the

start of sedation or induction of anesthesia. Sucrose should be treated as a clear liquid if used with the pacifier for comfort. Therefore the use of sucrose should cease 2 hours prior to sedation per ASA guidelines (III). Introducing a pacifier for the first time, with or without sucrose, may prove to be unrealistic in infants accustomed to breastfeeding. Also, mothers may try to avoid pacifiers (dummies) to prevent premature weaning. Studies on this have mixed results (I). If accepted by the infant and allowed by the mother, pacifiers (dummies) are an inexpensive and temporary way to relieve anxiety and improve the infant's comfort and physiologic status (I).

- *If possible, express and store breastmilk during the NPO period*. Until the time the mother can breastfeed again, she should be encouraged to express and store HBM for her own comfort and to avoid feedback inhibition of milk synthesis. Mothers should be advised of lactation rooms or other private spaces to express milk.

4. Breastfeed immediately after the procedure. After a minor procedure under anesthesia, if her child is stable, otherwise healthy, and the type of surgery does not prevent oral intake, a mother can immediately begin to breastfeed her infant as soon as he or she is awake (II-3). This increases comfort, reduces pain in the child, and is widely practiced and evidence-based, even following cleft lip and palate repairs.

Table: Summary of Fasting Recommendations to Reduce the Risk of Pulmonary Aspiration

Ingested Material	Minimum fasting period (hours)[a]
Clear liquids[b]	2
Human breastmilk	4
Infant formula	6
Non-human milks[c]	6
Light meal[d]	6

Note: These recommendations apply to healthy patients who are undergoing elective procedures. They are not intended for women in labor. Following the guidelines does not guarantee complete gastric emptying.

[a] The fasting periods noted above apply to all ages.

[b] Examples of clear liquids include water, fruit juices without pulp, carbonated beverages, clear tea, and black coffee.

[c] Because non-human milk is similar to solids in gastric emptying time, the amount ingested must be considered when determining an appropriate fasting period.

[d] A light meal typically consists of toast and clear liquids. Meals that include fried or fatty foods or meat may prolong gastric emptying time. Both the amount and type of foods ingested must be considered when determining an appropriate fasting period.

Definitions:

Levels of Evidence

I Evidence obtained from at least one properly randomized controlled trial

II-1 Evidence obtained from well-designed controlled trials without randomization

II-2 Evidence obtained from well-designed cohort or case-control analytic studies, preferably from more than one center or research group

II-3 Evidence obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled experiments (such as the results of the introduction of penicillin treatment in the 1940s) could also be regarded as this type of evidence.

III Opinions of respected authorities, based on clinical experience, descriptive studies and case reports; or reports of expert committees

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Conditions that require the use of anesthesia (encompassing the continuum of moderate sedation to general anesthesia) in breastfed infants

Guideline Category

Counseling

Management

Prevention

Risk Assessment

Clinical Specialty

Anesthesiology

Family Practice

Nursing

Nutrition

Obstetrics and Gynecology

Pediatrics

Surgery

Intended Users

Advanced Practice Nurses

Allied Health Personnel

Dietitians

Nurses

Physician Assistants

Physicians

Guideline Objective(s)

The main goals are to:

- To prevent pulmonary aspiration of gastric contents during anesthesia or sedation
- To prevent hypoglycemia intraoperatively and during the nothing by mouth (NPO) period
- To prevent volume depletion and maximize hemodynamics
- To minimize stress or anxiety in the NPO infant
- To support optimal breastfeeding of the dyad before and after the procedure

Target Population

Breastfed *nil per os* (NPO) infants in the preprocedure period and their mothers

Interventions and Practices Considered

Minor Painless Procedure or Procedures Requiring Local Anesthesia

1. Normal feeding routine, when possible
2. Breastfeeding for comfort during procedure without sedation
3. Postpone procedure if necessary to follow guidelines

Diagnostic Examinations or Invasive Procedures Requiring Pharmacologic Immobilization or Sedation

1. Withhold breastfeeding for at least 4 hours prior to anesthesia
2. Clear instructions to caregiver
3. Consider infant's daily medications
4. Continue clear liquids until 2 hours prior to anesthesia
5. Withhold formula, supplements, non-human milk, and solid foods for at least 6 hours prior to the anesthesia
6. Postpone sedation

Comfort for the Infant and Mother

1. Use of a pacifier
2. Express and store breastmilk during the *nil per os* (NPO) period
3. Breastfeed immediately after procedure

Major Outcomes Considered

- Aspiration of gastric contents
- Adverse outcomes of procedure, including pulmonary aspiration, hypoglycemia, volume depletion, hemodynamic instability
- Lung injury from aspiration, including respiratory distress syndrome, alveolitis, atelectasis, and/or post-obstructive pneumonia
- Unnecessary discomfort and anxiety

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

An initial search of relevant published articles written in English in the past 20 years in the fields of medicine, psychiatry, psychology, and basic biological science is undertaken for a particular topic. Once the articles are gathered, the papers are evaluated for scientific accuracy and significance.

Pubmed was searched for articles published between 2001 and 2012. Papers written in the last 10 years and sentinel articles from journals primarily written in English and from developed countries were included in the search. Search terms include: infants, pre-operative fasting, aspiration, anesthesia, npo, breast milk, gastric emptying, pacifier use and early weaning, comfort while fasting, and pneumonitis.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Expert Consensus (Committee)

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Levels of Evidence

I Evidence obtained from at least one properly randomized controlled trial

II-1 Evidence obtained from well-designed controlled trials without randomization

II-2 Evidence obtained from well-designed cohort or case-control analytic studies, preferably from more than one center or research group

II-3 Evidence obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled experiments (such as the results of the introduction of penicillin treatment in the 1940s) could also be regarded as this type of evidence.

III Opinions of respected authorities, based on clinical experience, descriptive studies and case reports; or reports of expert committees

Methods Used to Analyze the Evidence

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

An expert panel is identified and appointed to develop a draft protocol using evidence based methodology. An annotated bibliography (literature review), including salient gaps in the literature, are submitted by the expert panel to the Protocol Committee.

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

Not stated

Rating Scheme for the Strength of the Recommendations

Not applicable

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

The draft protocol is peer reviewed by individuals outside of contributing author/expert panel, including specific review for international applicability. The Protocol Committee's sub-group of international experts recommends appropriate international reviewers. The Chair and/or protocol resource person institutes and facilitates this process. Reviews are submitted to the committee Chair and resource person.

The contributing author/expert panel and/or designated members of protocol committee work to amend the protocol as needed.

The draft protocol is submitted to the Academy of Breastfeeding Medicine (ABM) Board for review and approval. Comments for revision will be accepted for three weeks following submission. The Chair, resource person and protocol contributor(s) amend the protocol as needed.

Following all revisions, the protocol has the final review by original contributor(s) to make final suggestions and ascertain whether to maintain contributing authorship.

The final protocol is submitted to the Board of Directors of ABM for approval. A two-thirds majority of Board members' positive vote is required for final approval.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for selected recommendations (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

- Appropriate preprocedural fasting for the breastfed infant
- Prevention of pulmonary aspiration of gastric contents during anesthesia or sedation
- Prevention of hypoglycemia intraoperatively and during the *nil per os* (NPO) period
- Prevention of volume depletion and maximize hemodynamics
- Minimization of stress or anxiety in the NPO infant
- Optimal breastfeeding of the dyad before and after the procedure

Potential Harms

Not stated

Qualifying Statements

Qualifying Statements

A central goal of The Academy of Breastfeeding Medicine is the development of clinical protocols for managing common medical problems that may impact breastfeeding success. These protocols serve only as guidelines for the care of breastfeeding mothers and infants and do not delineate an exclusive course of treatment or serve as standards of medical care. Variations in treatment may be appropriate according to the needs of an individual patient. These guidelines are not intended to be all-inclusive, but to provide a basic framework for physician education regarding breastfeeding.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Resources

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Safety

Identifying Information and Availability

Bibliographic Source(s)

Academy of Breastfeeding Medicine. Recommendations for preprocedural fasting for the breastfed infant: "NPO" Guidelines. Breastfeed Med. 2012 Jun;7(3):197-202. [43 references] PubMed

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2012 Jun

Guideline Developer(s)

Academy of Breastfeeding Medicine - Professional Association

Source(s) of Funding

Academy of Breastfeeding Medicine

This work was supported in part by a grant from the Maternal and Child Health Bureau, U.S. Department of Health and Human Services.

Guideline Committee

Academy of Breastfeeding Medicine Protocol Committee

Composition of Group That Authored the Guideline

Academy of Breastfeeding Medicine Protocol Committee: Kathleen A. Marinelli, M.D., FABM *(Chairperson)*; Caroline J. Chantry, M.D., FABM *(Co-Chairperson)*; Maya Bunik, M.D., MSPH, FABM *(Co-Chairperson)*; Larry Noble, M.D., FABM *(Translations Chairperson)*; Nancy Brent, M.D.; Alison V. Holmes, M.D., M.P.H., FABM; Ruth A. Lawrence, M.D., FABM; Nancy G. Powers, M.D., FABM; Tomoko Seo, M.D., FABM; Julie Scott Taylor, M.D., M.Sc., FABM

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Financial Disclosures/Conflicts of Interest

Not stated

Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: Available in Portable Document Format (PDF) from the Academy of Breastfeeding Medicine Web site .

Print copies: Available from the Academy of Breastfeeding Medicine, 140 Huguenot Street, 3rd floor, New Rochelle, New York 10801.

Availability of Companion Documents

The following is available:

- Procedure for protocol development. Academy of Breastfeeding Medicine. 2011 Mar. 2 p. Available in Portable Document Format (PDF) from the Academy of Breastfeeding Medicine Web site .

Print copies: Available from the Academy of Breastfeeding Medicine, 140 Huguenot Street, 3rd floor, New Rochelle, New York 10801

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI Institute on February 18, 2013. This summary was updated by ECRI Institute on October 28, 2013 following the U.S. Food and Drug Administration advisory on Acetaminophen.

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